

AMENDMENTS TO THE CLAIMS

Claims 1-28. (Cancelled)

Claim 29. (Currently Amended)

A hydraulic control valve comprising:

a valve body, including a plurality of valve body lands; and

a valve spool, fitted into said valve body so as to be changeable in relative angle, said valve spool including a plurality of valve spool lands;

wherein ~~only one of~~ said valve body ~~and said valve spool~~ includes pairs of chamfers which are so formed that each of ~~ones of~~ the valve body lands ~~and the valve spool lands~~ has only one chamfer.

Claim 30. (Currently Amended)

The hydraulic control valve according to claim 29, wherein the pairs of chamfers are comprised of adjacent valve ~~spool~~ body lands, each having a single chamfer provided on an alternate corner from each adjacent valve ~~spool~~ body land.

Claim 31. (Withdrawn)

The hydraulic control valve according to claim 29, wherein alternating pairs of chamfers are on the same valve spool posts.

Claim 32. (Withdrawn)

The hydraulic control valve according to claim 29, wherein alternating pairs of chamfers are on the same valve body posts.

Claim 33. (Withdrawn)

The hydraulic control valve according to claim 29, wherein alternating pairs of chamfers are on consecutive valve body posts.

Claim 34. (Previously Presented)

The hydraulic control valve according to claim 29, wherein said valve body includes a plurality of first oil grooves formed between said valve body lands.

Claim 35. (Previously Presented)

The hydraulic control valve according to claim 34, wherein said valve spool includes a plurality of second oil grooves formed between said valve spool lands.

Claim 36. (Previously Presented)

The hydraulic control valve according to claim 35, wherein gaps between said first and second oil grooves, which are adjacent in the peripheral direction act

as throttle portions which change throttle areas in accordance with a relative angular displacement between said valve body and valve spool.

Claim 37. (Previously Presented)

The hydraulic control valve according to claim 35, wherein ones of said first and second oil grooves alternately act as oil supply chambers and oil discharge chambers, and the others of said first and second oil grooves acting as oil feed chambers interposed between said oil supply chambers and oil discharge chambers.

Claim 38. (Previously Presented)

The hydraulic control valve according to claim 29, wherein chamfers adjust a throttle area.

Claim 39. (Currently Amended)

A power steering apparatus, comprising:

a hydraulic pump, being driven by an electric motor for supplying oil pressure to a hydraulic cylinder for steering assistance; and

a hydraulic control valve; interposed in a hydraulic pressure path between said hydraulic pump and hydraulic cylinder, for controlling oil pressure from said hydraulic pump to two cylinder chambers included in said hydraulic cylinder, said hydraulic control valve comprising:

a valve body, including a plurality of valve body lands; and a valve spool, fitted into said valve body so as to be changeable in relative angle, said valve spool including a plurality of valve spool lands;

wherein ~~only one of~~ said valve body ~~and said valve spool~~ includes pairs of chamfers which are so formed that each of ~~ones of~~ the valve body lands ~~and the valve spool lands~~ has only one chamfer.

Claim 40. (Cancelled)

Claim 41. (Withdrawn)

A power steering apparatus, comprising;
a hydraulic pump, being driven by an electric motor for supplying oil pressure to a hydraulic cylinder for steering assistance; and
a hydraulic control valve, interposed in a hydraulic pressure path between said hydraulic pump and hydraulic cylinder, for controlling oil pressure from said hydraulic pump to two cylinder chambers included in said hydraulic cylinder, wherein said hydraulic control valve is the hydraulic control valve described in claim 31.

Claim 42. (Withdrawn)

A power steering apparatus, comprising;
a hydraulic pump, being driven by an electric motor for supplying oil pressure to a hydraulic cylinder for steering assistance; and
a hydraulic control valve, interposed in a hydraulic pressure path between said hydraulic pump and hydraulic cylinder, for controlling oil pressure from said hydraulic pump to two cylinder chambers included in said hydraulic cylinder, wherein said hydraulic control valve is the hydraulic control valve described in claim 32.

Claim 43. (Withdrawn)

A power steering apparatus, comprising;
a hydraulic pump, being driven by an electric motor for supplying oil pressure to a hydraulic cylinder for steering assistance; and
a hydraulic control valve, interposed in a hydraulic pressure path between said hydraulic pump and hydraulic cylinder, for controlling oil pressure from said hydraulic pump to two cylinder chambers included in said hydraulic cylinder, wherein said hydraulic control valve is the hydraulic control valve described in claim 33.

Claims 44-55. (Cancelled)

Claim 56. (Withdrawn)

A power steering apparatus, comprising;

a hydraulic pump, being driven by an electric motor, for supplying oil pressure to a hydraulic cylinder; and

a hydraulic control valve, for controlling oil pressure from said hydraulic pump to cylinder chambers included in said hydraulic cylinder,

said hydraulic control valve comprising:

a valve body, including a plurality of valve body posts;

a valve spool, fitted into said valve body so as to be changeable in relative angle, s

aid valve spool including a plurality of valve spool posts;

chamfers, wherein said chamfers are the chamfers of claim 31.

Claim 57. (Withdrawn)

A power steering apparatus, comprising;

a hydraulic pump, being driven by an electric motor, for supplying oil pressure to a hydraulic cylinder; and

a hydraulic control valve, for controlling oil pressure from said hydraulic pump to cylinder chambers included in said hydraulic cylinder,

said hydraulic control valve comprising:

a valve body, including a plurality of valve body posts;
a valve spool, fitted into said valve body so as to be changeable in relative angle,
said valve spool including a plurality of valve spool posts;
chamfers, wherein said chamfers are the chamfers of claim 32.

Claim 58. (Withdrawn)

A power steering apparatus, comprising;
a hydraulic pump, being driven by an electric motor, for supplying oil pressure to
a hydraulic cylinder; and
a hydraulic control valve, for controlling oil pressure from said hydraulic
pump to cylinder chambers included in said hydraulic cylinder,
said hydraulic control valve comprising:
a valve body, including a plurality of valve body posts;
a valve spool, fitted into said valve body so as to be changeable in relative angle,
said valve spool including a plurality of valve spool posts;
chamfers, wherein said chamfers are the chamfers of claim 33.

Claims 59-73. (Cancelled)

Claim 74. (Currently Amended)

The power steering apparatus according to claim 39, wherein the pairs of
chamfers are comprised of adjacent valve body ~~spool~~ lands, each having a

single chamfer provided on an alternate corner from each adjacent valve ~~spool~~
body land.

Claim 75. (Previously Presented)

The power steering apparatus according to claim 39, wherein
said hydraulic pump is driven such that a flow rate becomes low flow
rate or zero flow rate when steering is not carried out, and such that the flow
rate becomes high in accordance with steering angular velocity when steering
is carried out, and

said valve body includes a plurality of first oil grooves formed between
said valve body lands.

Claim 76. (Previously Presented)

The power steering apparatus according to claim 75, wherein said valve
spool includes a plurality of second oil grooves formed between said valve spool
lands.

Claim 77. (Previously Presented)

The power steering apparatus according to claim 76, wherein gaps
between said first and second oil grooves, which are adjacent in the peripheral
direction act as throttle portions which change throttle areas in accordance
with a relative angular displacement between said valve body and valve spool.

Claim 78. (Previously Presented)

The power steering apparatus according to claim 76, wherein ones of said first and second oil grooves alternately act as oil supply chambers and oil discharge chambers, and the others of said first and second oil grooves acting as oil feed chambers interposed between said oil supply chambers and oil discharge chambers.

Claim 79. (Previously Presented)

The power steering apparatus according to claim 39, wherein said hydraulic pump is driven such that a flow rate becomes a low flow rate or zero flow rate when steering is not carried out, and such that the flow rate becomes high in accordance with steering angular velocity when steering is carried out, and chamfers adjust throttle area.

Claim 80. (Previously Presented)

The power steering apparatus according to claim 39, wherein said electric motor drives said hydraulic pump such that oil pressure is supplied at zero flow rate or predetermined small flow rate as small as possible when steering is not carried out, and such that the oil pressure is abruptly supplied at high flow rate in accordance with the steering angular velocity at the steering is carried out, and

said valve body includes a plurality of first oil grooves formed between said valve body lands.

Claim 81. (Previously Presented)

The power steering apparatus according to claim 80, wherein said valve spool includes a plurality of second oil grooves formed between said valve spool lands.

Claim 82. (Previously Presented)

The power steering apparatus according to claim 81, wherein gaps between said first and second oil grooves, which are adjacent in the peripheral direction act as throttle portions which change throttle areas in accordance with a relative angular displacement between said valve body and valve spool.

Claim 83. (Previously Presented)

The power steering apparatus according to claim 81, wherein ones of said first and second oil grooves alternately act as oil supply chambers and oil discharge chambers, and the others of said first and second oil grooves acting as oil feed chambers interposed between said oil supply chambers and oil discharge chambers.

Claim 84. (Previously Presented)

The power steering apparatus according to claim 39, wherein
said electric motor drives said hydraulic pump such that oil pressure is
supplied at zero flow rate or predetermined small flow rate as small as possible
when steering is not carried out, and such that the oil pressure is abruptly
supplied at high flow rate in accordance with the steering angular velocity at
the steering is carried out, and chamfers adjust throttle area.